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ABSTRACT

A study of the use of citations (references to the work of previous researchers) in articles reporting research focuses on the writer's motivation in using them. It is suggested that citation is a rhetorical element that contributes considerably to the persuasive tone of the article, and that citations are introduced primarily to support or be supported by some other proposition in the context. A semantic analysis of a number of excerpts from research articles looked at patterns of citations in three categories (supporting, supported and non-supporting) and described ways in which the support role is indicated in language elements, including explicit signals of support and semantic relations. The head-support relation is proposed as an addition to the existing typology of semantic relations. It was found that the support provided by citations was not all of the same sort, and the existence of a range of support (primary to secondary to complementary) is also proposed. Contains 18 references. (MSE)

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ED 414 750

Citation as Persuasion in Research Articles

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Abstract

The medium of the research article is widely used for publicising research findings and knowledge claims and making them accessible to the rest of the research community. This communicative purpose, which contributes to the generic identity of the research article, is achieved, in part, through a significant identifying feature - Citation or references to the work of previous researchers.

The question that arises is **why cite** -- what is the writer's point in referring to the work of others? Our aim in this paper is to investigate the role of Citation in research articles and the motivation of writers who decide to report on other researchers' findings in the body of their own articles.

An important aspect of Citation is that, by reporting other researchers' findings, it creates inter-textual links among the texts produced by different researchers within the same field.

Sociological investigations of the research article suggest that it is increasingly being viewed as a persuasive genre. We suggest that Citation is a rhetorical element which contributes significantly to the overall persuasive tone of the article. Our specific aim in the present paper was to investigate this rhetorical role of Citation in linguistic terms. We hypothesise that Citations are primarily introduced into the body of an article to support or to be supported by some other proposition in the context.

On the basis of a semantic analysis of Citations we attempt to demonstrate that the persuasive motivation is effected through the creation of the Head-Support relation in addition to other semantic relations between Citations. We suggested a typology of Citations in terms of Support, consisting of Supporting, Supported and Non-Supporting Citations. The support could be represented as a cline with points of varying intensity, ranging from Primary Support, Secondary Support to Complementary Support.

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Introduction

The academic research article has been described as a written text reporting on some investigation carried out by its authors, and which usually relates its findings to those of others, (Swales, 1990). It is the

main vehicle for the transmission and exchange of information about the most recent research findings and the presentation of knowledge claims.

The work of sociologists of science has provided interesting perspectives on the nature of scientific texts, in particular, research articles. Such sociological investigations (Latour and Woolgar, 1979; Gilbert, 1976; Gilbert and Mulkay, 1984) suggest that scientific texts are not necessarily straightforward pieces of evidence, that they are the products of social accounting which are presented as objectively related to observed data. From the general view of scientific texts as portraying scientific argument, sociologists of science have suggested the presence, in texts, of rhetorical elements aimed at persuasion. The common denominator in such works is that they study the production of scientific knowledge in terms of the social construction of facts. Scientific activity is not seen to be the objective discovery and recording of the facts of science as they exist out there in the world, but as the scientist's perception and representation of reality.

Latour and Woolgar (1979) focus on the scientific activities in a laboratory to show how scientific practices become transformed into statements in a research article, which is the end-product, reporting the research in a marketable form for the consumption and persuasion of its readers. This production of papers is acknowledged by participants as the main objective of their activity.

Another approach to the view of scientific knowledge as the product of the scientists' operations, is that of Gilbert and Mulkay, (1984) which compares scientists' accounts of their activities and beliefs in two contexts of linguistic production:

i) **empiricist repertoire,** the experimental research paper in which they report their research,
ii) **contingent repertoire,** scientists' spoken accounts in informal interaction.

Gilbert and Mulkay's account is very revealing of the ideological bases involved in scientists' variable accounts of their practices in these different contexts. The empiricist discourse of the research article is shown to be the product of the scientist-writer's decision on how to interpret phenomena rather than a direct reflection of scientific reality.

Gilbert (1976) considers how the scientist demonstrates the veracity of his work by showing that the procedures, theories and data on which the

arguments in her/his paper are based are those approved by the scientific community. One device for gaining such recognition is by citing papers which provide authority for the author's argument and corroborate the claims made.

This view of the rhetorical nature of scientific writing is obviously a departure from the idea that the features of research articles are necessarily determined by prescriptions laid down by the conventions of article writing. The general assumption about one such feature -- Citation or Reporting -- is that it delimits the area of research and, by summarising relevant previous studies, serves to contextualise the writer's current study. An important aspect of Citation is that, by reporting other researchers' findings, it allows for an interplay between the knowledge claims of different researchers within the same discipline. Citation, thus, has a significant role in giving the research article its communicative purpose and in setting it apart in terms of genre.

Our aim is to investigate the role of Citation in research articles and the motivation of writers who decide to introduce information from external sources into the body of their own articles. Studies which treat the aim of the scientific article as **the successful persuasion of readers** have got the most to offer those of us who are interested in accounting linguistically for the features of these articles. Our starting point, based on preliminary investigations of scientific research articles, was that the use of language and the staging of the argumentation in them suggest a persuasive motivation and we hypothesise that Citation is used as a vehicle for effecting the persuasion.

Citation in Research Articles

The sociological approaches described above did not aim to show the linguistic manifestations of the persuasive motivation. Chubin and Moitra's (1975) attempt to construct a typology of references according to a content analysis, i.e. **Affirmative, Supplementary** and **Negational** references, is of interest although, like the other studies referred to, it is not made in linguistic terms.

We consider that the function of any feature in the text should be identifiable as a linguistic phenomenon and, thus, our purpose is to examine the function of Citation in linguistic terms.

A pedagogic approach by Swales (1983) discusses reporting as **Describing Previous Research,** as one part of a four-move structure making up the Introduction sections of articles. Its function is seen

essentially as contextualising the writer's intended research and providing the background for the next move which indicates a gap in the reported previous research. However, this does not account sufficiently for the complexities of the feature of Citation. Also, since Citations are pervasive throughout the article and not limited to article introductions, they must have a more extensive role than merely justifying the reporter's research.

Tadros, (1981), has investigated Reporting as a category of Prediction in economics texts. This type of reporting is identified by the presence of an explicit signal that attributes the proposition to another source. The contextual function of Reporting, as Tadros describes it, is to predict negative evaluation.

One linguistic investigation which refers to the function of Citations in dissertations in terms of support is that of Dudely-Evans (1986). He makes note of two moves in the Discussion sections -- **References to Previous Research** and also **References to Previous Research (support).** In connection with the latter, he states:

Another use made of references to previous research is to support a hypothesis made. (Dudley-Evans, 1986:143)

This is a very pertinent point which, unfortunately, is not developed further. We consider that the support function of references to previous research is far more extensive than suggested by these studies and needs to be explored further.

Corpus and Basic Assumptions

The corpus for this study consists of eleven research articles on psychosomatic medicine from the British journal -- **British Journal of Psychosomatic Medicine.** They were selected at random, provided they were not review articles. These articles provided the 129 Citations for analysis as well as the contextual framework for the proposed investigation.

We take as given certain social processes involved in the formulation and dissemination of claims through the medium of research articles. Our basic assumptions (derived from and explicitly stated and justified in the studies referred to above) are outlined below.

A researcher who has investigated an area and produced results and findings will want to communicate them to a readership for their evaluation. S/He hopes to convince other scientists of the significance of

the findings so that they will eventually attain knowledge status. The way in which these claims are communicated will influence their acceptability and the effect they have as new knowledge.

The formal research article demands of the writer that it be presented as an objective record of the phenomena in the real world, that the researcher does not influence or shape it in any way. To convince readers that s/he has uncovered facts existing in the world and to demonstrate that the findings, are credible, the writer has to show that they result from the use of well-established and scientifically approved procedures and evidence. S/he also has to show that the theory and ideas on which argumentation is based are closely aligned to those currently approved by the scientific group. Most researchers are not developing models and theories entirely independently of existing ones although they may modify or extend them in accordance with the needs or results of their particular research. Thus, there is a great deal of interdependence between studies, in that most of the research in an area draws on currently approved core notions in the field. This provides a degree of consensus within the research tradition and allows researchers to demonstrate their membership of the research community. It is, therefore, entirely in the researcher's interests to show that his/her approach is not incompatible with those of others in the immediate field. It increases the likelihood that the contribution will receive the right recognition.

These, then, are the basic assumptions with which we begin this discussion of the functions of Citation.

Motivation for Citation

Work on clause relations by Winter (1977), Hoey (1983) and Thompson and Mann (1986b) has demonstrated that the constituent parts of texts, whether clauses/sentences or larger elements, are held together by semantic relations. The texts which manifest such semantic relations are all propositions produced by one writer. However, in the research articles under consideration, the writer brings in several external textual sources of information and these disparate pieces of information are presented in such a way that they read as coherent, connected text. In a previous study (Thomas, 1991), we suggested that Citations, i.e. reported information from other sources, when juxtaposed in sequence, acquire particular types of meaning as connected text. This is because the reporting writer integrates the citations by creating semantic relations between the citations at different levels and in particular ways.

Thus, Citations may be interpreted in terms of the ways they relate semantically to their co-text, which may be other Citations or writer comments. However, writers seem to draw only upon a limited part, a sub-set, of the finite set of relations which create the coherence in this genre.

The clause relational approach suggested that Citations do acquire additional meaning arising from the rhetorical purpose of writers. It appears that some of this sub-set of clause relations can be further characterised in a way that reveals the rhetorical role of the Citations they connect. We hypothesised that the primary function of Citation might be to act as a device to obtain support for arguments that the writer is putting forward. The term **support** is used throughout this paper to refer to the use of information from any particular study to contribute to the advancement of the argumentation underlying the claims of another study. This contribution may take the form of a study building on the foundations of the supporting study, the use of techniques or procedures, the use of concepts in one study necessary for understanding the work in another, information on which the findings of the second study depend, the provision of independent but supporting evidence for a claim etc. Citations can be seen as the means which reporting writers use to obtain such support.

In general, the kind of semantic relation between Citations can be distinguished from other categories of such relations in that they carry the added semantic feature + **support**. A Citation, representing one part of such a semantic relation, has the effect of supporting another Citation or writer statement which is the second part of the relation. We have categorised such relations as **Support Role Relations.**

The two parts of the relation are the **Supporting** part and the **Supported** part. Therefore, when we refer to a **support role,** we simply mean that a Citation is being used to provide or to obtain support for some other proposition in the context. The Citation is either doing the supporting or is being supported by the other part of the relationship.

Our position, then, is that Citation is a device used by a writer to persuade potential readers of her/his membership of the research community and to enhance the significance and acceptability of the arguments in the article. The Citations can be used to effect these goals only because they are held together semantically by the support role relations.

On the basis of the support factor, Citations can be generally categorised into those which are **supporting**, those which are **supported** and those which are **support-denying**. Support-denying citations are those introduced into the discourse in order to be negatively evaluated. Obviously, their function is to deny support although their negative evaluation serves the writer's purpose. Since there were only 3 such support-denying citations in our corpus, they will not feature further in our description.

Supporting and Supported Reports

The support notion, by definition, requires two obligatory elements, the supporting and the supported element. One of these is necessarily a Citation while the second element can be either another Citation or a writer statement. Optional elements are signals of support (see below) or signals of other semantic relations in certain contexts. This can be represented as below:

Supporting Element [+ Signal of Support] + Supported Element

The support role of Citations in a text can be manifested linguistically in three ways.

i) Reports Connected by Explicit Signals of Support

Writers often signal very explicitly the support role of a Citation in its context by introducing a limited number of markers. Most typically, this is some form of the key word **support**. Examples of such markers attested in our data are:

i) supports; in support of this; is supported by; supporting this notion; support for Y; direct empirical support;
ii) is borne out by
iii) is consistent with
iv) further indication
v) similar
vi) Also

The markers in i) to iv) above are slightly different from those in v) and vi) as the former are explicit markers of the head-support semantic relation as posited below. The latter, on the other hand, are generally used to signal other clause relations such as Matching Compatibility but, in particular contexts, acquire the semantics of support. Our grounds for claiming that they acquire this additional meaning is that, in their contexts, the signals **similar** or **also** can be adequately paraphrased by one of the explicit signals specified in i) to iv) above.

Head-Support as Semantic Relation between Citations

In a number of cases, the markers of support connect citations with other citations or writer statements when there is no other obvious semantic relation holding the two parts together. Such examples make a case for a new semantic relation **head-support.** It is characterised as a specific relation between two Citations or between a Citation and a writer statement such that one of them acts as a Head while the main semantic function of the other in the text, is to support it. The relation is identified by the obligatory presence of one of the support markers specified in i) to iv) above. The structure consists of the following:

Supporting Element + Signal of Support + Supported Element

An example of a head-support relation is given below:

Example 1

1. *The results of the present study add further support to the general psychosomatic hypothesis concerning the negative relationship between non-verbal expressiveness and physiological activation.*
2. *Overall, the headache sufferers showed significantly less head and eye movements across the various phrases of the psychosocial stressor.*

The two parts in the Head-support relation here are:

HEAD — *The general psychosomatic hypothesis concerning the negative relationship between non-verbal expressiveness and physiological activation.*

SUPPORT — *The results of the present study i.e. Overall, the headache suffers showed significantly less head and hand movements across the various phases .....*

In Sentence 1, there are two parts in the relationship: *the results of the present study and the general psychosomatic hypothesis.* In the context, *results,* is a cataphoric noun which is lexically realised in Sentence 2. This allows the two propositions, represented by the terms *results* and *hypothesis,* to be brought together and shown as semantically related. The relationship between them is one of support and this is explicitly signalled by *add further support.*

The writer has focused on this relationship in order to show that his work is within the field of current interest -- the general psychosomatic hypothesis. In the preceding sections of the article, it has been made clear that the writer's own work is in a context of research investigating this

hypothesis. He has cited other studies of *the inverse relationship between expressiveness and physiological reactivity* which are all intended to be contributions to the development of the knowledge of this particular area of research. He thus attempts to convince readers that he is working in an area that is recognised to be of interest and approved by the immediate research community, in that they are all concerned with similar phenomena and issues. Having done this, there is also pressure on the writer to demonstrate that his findings are compatible with the models and theories currently accepted by his fellow researchers. Endorsement of the findings by the scientific community depends on such compatibility.

The support relation with its explicit signal *adds further support,* in Sentence 1 above, is an assertion of the compatibility between the writer's own set of results and the compatibility between the writer's own set of results and the currently approved hypothesis in the area. The *psychosomatic hypothesis* is one that has been acknowledged to be adequate (signalled by *general*) and therefore it is more effective to cite it rather than one that is less widely known and accepted. The introduction of the Citation at this point in the article is, therefore, evidence of the writer's attempt to convince his prospective specialist readers that the necessary degree of consensus for credibility exists. It is within this framework of general compatibility that the writer makes the claim of a finding that is also new or original.

The example above illustrated the writer's attempt to gather support for the results of his own research by reporting from another source. The support relation that we posit does not exist only between a statement originating from the writer and a piece of reported information from an external source. The very same relation often exists between two citations from two different sources so that one Citation is shown to support another Citation. The underlying motivation, however, remains unchanged. The writer is still attempting to enhance the strength of his overall argument by reporting information which supports a Citation that is necessary for the line of argument that he is following. This is seen in the example below:

EXAMPLE 2

1. *Morgan and Roberts [3] maintain that 10 weeks may not be long enough to reveal a change in relatively stable and basic personality traits.*
2. *They suggest that prolonged and intense exercising may be necessary before psychometric tests can reflect a change.*
3. *Ismail and Trachtman [22] as well as Buccola and Stone [23] have provided evidence supporting this notion.*

4. *Specifically they found emotional stability, imaginativeness, self-sufficiency, conscientiousness, persistence and seriousness to increase in strength after prolonged exercise.*

In this example, the writer is not relating his own work to other studies in the area but the position stated in the Citation in Sentences 1 and 2 is, nevertheless, one that he wants to maintain. The evidence necessary to convince his readers of the validity of this position does not necessarily have to come from his own research or by his arguing for it. It can come from the research already conducted and received by the scientific community. Such intertextual support needs only be reported and brought into the body of the article. The purpose of introducing the second Citation (S 3, 4) and its role in relation to the first is asserted in the signalling sentence:

Ismail and Trachtman [22] as well as Buccola and Stone [23] have provided evidence supporting this notion.

The pattern in this category of support relation is made up of three elements:
Element 1 A Citation of a finding from another source *or* A statement of writer's own findings.
Element 2 A signalling sentence or a marker of support.
Element 3 A Citation of a finding from an external source.

We note that the support relationship is not in any invariable linear order, i.e. it is not necessarily the case that Element 1 is the supported finding while Element 3 is the supporting findings or vice versa. The relationship can be stated either as:

Finding X supports Finding Y

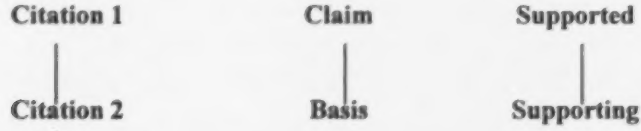
Or as

Finding X is supported by Finding Y

Role of Other Clause Relations in Indicating Support

In the section above, we argued for a head-support relation between a Citation and another statement because one part of the pair had no other role in the text except to provide support. Apart from this new head-support relation, the remaining kinds of semantic relations considered to be typical of the genre, (e.g. claim-basis, general-particular, cause-consequence) also can serve to convey the notion of support of one part for the other. The support role relationship is not inherent in the semantic relation itself in the way it is for the head-support relation discussed

above. Rather, it is instantially created in the context. That is to say, the two parts are in a semantic relation such as Claim-Basis, (but not the head-support). However, in the particular context, they also acquire the added semantics of a support role relationship such that one part is perceived as supporting and the other part as being supported. This can be crudely glossed as:



The semantic relation itself can thus become the linguistic manifestation of a support role relationship between pairs of statements which include citations. The support role, in this case, can operate in two ways. Sometimes the meaning created by the semantic relation works in conjunction with an explicit signal of support of the kind described above for the head-support relation. In such cases, the citations would be treated as being in multiple relations. In the second group, there is no explicit signal that the Citation is serving a support role. However, there is an implicit meaning drawn from the semantic relation which the Citation forms with the second member of the relationship *in that particular context*. This is discussed further below

Support as Text Specific

We have said before that the support role relation of the Citations discussed above is not an inherent function of the clause relation that the Citation has with the second member. That is, the meaning created by the clause relation does not of necessity carry with it the meaning of support. For example it might be said that any statement in a Matching Compatibility relation with another statement will support it, and similarly a statement in a Matching Contrast relation with another will, of necessity, refute it or deny support for the second statement. This is not necessarily so, and the support role relation can be instantially created in its particular context of occurrence. The example below illustrates this.

EXAMPLE 3

1. *Table 1 shows that for disproportionate disability the psychological variables were more predictive than the physiological variables, with no physiological variable emerging in the analysis.*
2. *These results are consistent with the work of Rutter [5], who found that attitude and belief measures were the most important predictors.*

3. *However, Rutter's outcome measures were concerned specifically with time off work, whereas the present study was concerned primarily with disability.*
4. *It appears that attitudes and beliefs are of fundamental importance over a wide range of relevant variables in relation to chronic bronchitis patients.*

Sentence 1 above states the results of the writer's own research. In Sentence 2, these results are compared with the findings of another study and said to be consistent with them. In our terms, this indicates that they support the reported findings.

We are here especially interested in Sentence 3 in which one aspect of the reported study is contrasted with that of the writer's own work. The Matching Contrast between the two is marked by the connectors, *however* and *whereas*, which indicate that the two are semantically incompatible. One might expect that the semantic relation of contrast would signal the textual function of negative evaluation or refutation of this aspect of the study. However, in this context, the Matching Contrast relation serves to increase the support for the reported idea rather than refute it. This support role is not precluded by a Matching Contrast relation; on the contrary, it acquires the support in this particular context. The writer's research was concerned with the *disability* variable while the reported research was concerned with the *time off work* variable. Sentence 4 makes it clear that his contrast only serves to strengthen the writer's case by allowing him to draw a broader generalisation in place of his original claim in Sentence 1, namely, that the *psychological variables were more predictive than the physiological ones*. He can claim that a *wide range of relevant* variables is involved as it can now be seen to have been demonstrated in relation to both *the disability* variable of his own research as well as the *time off work* variable of the cited study. The support effect here is thus instantially created and specific to the text.

Clause Relations with an Implicit Support Role

This category of citations/writer statements are connected by any of the previously referred to sub-set of semantic relations typical of the genre, other than the clause relation of head-support. The difference between this category and those described in the section above is that there are no explicit support signals. Any signals that are present are those signalling the semantic relations. In the absence of signals of any particular clause relations, it appears that the reader perceives the support role relation of a Citation in its context as a result of his/her ability to trace a common core proposition in the supported and supporting parts of the stretch of text.

This core proposition may not be explicitly stated in the two parts. It is interpretative and often the reader has to arrive at it step by step, by identifying parallelisms and semantic compatibility between the parts.

The example below shows citations in some of the commonly occurring semantic relations and illustrates how the support works.

EXAMPLE 4

1. *Several lines of evidence suggest that the autonomic response to stress is excessive in the early stages of hypertension.*
2. *Obrist and his colleagues [19], found that challenging tests provoked activity in beta-adrenergic pathways between the sympathetic nervous system culminating in myocardial responses, particularly during the initial stages of the test.*
3. *Myocardial reactivity was greater in sons of hypertensive parents than in sons of normotensive parents [4].*

Sentence 1 is a generalised conclusion by the writer, while Sentences 2 and 3 give the particulars of *several lines of evidence.* We set the related parts of the generalisation against the appropriate parts of the statements below:

GENERALISATION	PARTICULARS
several lines of evidence	**Obrist and colleagues**
autonomic response	**provoked activity in**
	myocardial responses
	Myocardial reactivity
stress	**challenging tests**
early stages of hypertension	**initial stages of test.**
	sons of hypertensives.

In the example above, a Generalisation, which is a conclusion, is followed by Particulars, which are citations of results of other studies. There are no explicit signals which indicate the rhetorical function of the citations in Sentences 2 and 3 in relation to Sentence 1. But the semantic relation between the two parts allows a reader to perceive that the reported information in Sentences 2 and 3 is semantically compatible with, and, therefore, supports the general statement in Sentence 1.

Our claim that the semantic relation of General-Particular, in this context, is the linguistic manifestation of the rhetorical support that the Citations in Sentences 2 and 3 provide, is also borne out by a consideration of the function of the generalisation in Sentence 1 of the text. In the preceding

context the writer puts forward three possible explanations of results he has obtained in his own study. This is stated as:

EXAMPLE 5
This difference could have originated a) in the subjects initial emotional response b) in the transmission of the response via the autonomic nervous system, or c) in the target organs.

The three possibilities are discussed in turn and a) and c) are rejected as not being reasonable explanations. The explanation in b) however is put forward as more acceptable and this is done by citing studies which have results which are compatible with the notion *of the transmission of the response via the autonomic nervous system.* This is the explanation that the writer favours and he argues for it by stating particulars of studies which agree with it. He can make a case for it more effectively by citing the relevant findings of other studies which have already been validated and demonstrated for fellow scientists. The writer can take advantage of the acknowledged acceptability of these findings and, by citing them, gather support for the explanation he endorses.

Criteria for Support Role of Reports

There are criteria which enable us to identify a Citation used for the rhetorical purpose of obtaining support.

Criterion 1: Signals of Support

The single most important way of identifying Citations which are being used for a support motivation is the presence of one of the signals of support specified in the section above. The presence of these signals also distinguishes the citations which were being explicitly used for support from those whose support role was implicit. The extracts below illustrate how the presence of the support signal a) creates a head-support relation, and b) highlights the additional rhetorical function of Citations which are already in a particular clause relation with another Citation clause relation.

A. Signals in Head-Support Relation

The following is a typical example:

EXAMPLE 6
Thus, the similar pattern of response in the two groups during the neutral and general stress scenes provides support for stimulus specificity theories [16].

The head element is merely referred to here in reduced form but the full referent is retrievable from the preceding context. The underlined signal is crucial for creating a relation between the two parts and allowing the reader to see that the writer's results are being used rhetorically to provide support for the specified theories.

B. Signals of support co-occurring with other clause relations

The extract below consists of two Citations which are in a semantic relation of General-Particular.

Example 7

1. *There is increasing support for the hypothesis that stress related fluctuations in sympathetic activity may initiate the haemodynamic cascade toward hypertension in genetically susceptible individuals [4, 6, 7].*
2. *One line of evidence of particular relevance to this report comes from the study of young adults at risk for essential hypertension because they have a family history of this disorder or they exhibit labile hypertension.*
3. *Such at-risk individuals show elevated heart-rate blood pressure and plasma catecholamine responses to some laboratory stresses.*

Sentence 2 which provides particulars is thereby providing support for the Citation in Sentence 1 which states the general proposition. This rhetorical role of the citations is made explicit by the signal underlined in Sentence 1 above.

Criterion 2: Deletion of Signals of Support

Another way of testing a Citation in its context for a support role is by removing any support signals that are already present. If the coherence of the text is disturbed, then it is likely that the Citation had a support role.

Criterion 3: Deletion of Head Element

Additionally, it is possible, in Citations which are in a Head-Support relation, that is where a Citation or writer comment has support as its main function in the text, to delete the head. The effect of this on the coherence and acceptability of the text will give an indication of the role of the Citation in the context.

Criterion 4: Insertion of Support Signal

Where no explicit signals of support are present in the text, the possibility of insertion of an appropriate marker between the citations or Citation and

writer statement will enable the reader to perceive a support role. An example of this is provided in (8) below:

EXAMPLE 8

1. *The research reviewed suggests that basic personality structure does not change as a result of improved physical fitness resulting from short-term exercise programs [1, 2, 5].*
2. *[In support of this] Morgan and Roberts [3] maintain that [this is because] 10 weeks may be long enough to reveal a change in relatively stable and basic personality traits.*
3. *They suggest that prolonged and intense exercising may be necessary before psychometric tests can reflect a change.*

In this example, the functional role of the two citations is made explicit by inserting an appropriate marker of support (in square brackets above). The second cited study, in providing an explanation for the phenomenon observed in the first study, accepts the finding itself as valid and significant. It supports the first finding by taking it as the given in order to provide an explanation for it and thereby extends the previous work.

Degrees of Support

Citations in a support relationship can be distinguished, in part, by the kind of support provided, i.e. the extent to which the reported information is essential to the thread of the writer's argument and the main knowledge claim s/he is attempting to make. For this, it would be more appropriate to see the Citations as clustering along different positions on a cline of support rather than belonging to clearly distinguishable categories with absolute values. The boundaries are generally fuzzy and we make no claims for the kind of criteria which will identify them invariably. This notion is represented as below:

most essential **least essential**

<---------->

Primary Support **Secondary Support** **Complementary Support**

Primary Support

Citations which have a primary support role are generally introduced in direct connection with the statement of aim or hypothesis of the writer's own research or in a context of the discussion of his/her own findings. The Citations are integral to the writer's argument and the research

depends on being able to take the reported information as established knowledge.

Secondary Support

A large part of the citations in our data can be considered to fall into this category. They may serve a variety of specific functions in their contexts but the common feature is that they generally help to increase the reader's willingness to accept or agree with an idea that needs promotion. The cited studies are intended to be seen by readers as authoritative because they present findings that are valid and important. They provide additional evidence which originates from a source outside the study which put forward the claim in the first place.

Citations which provide secondary support of another Citation may not be integral for the development of the writer's central argument. Nevertheless, they support a reported proposition that the writer endorses and wishes to present as an established idea. In such cases it is the supported Citation that relates to the writer's comments or claims. The supporting Citation relates to its head Citation and only indirectly, through it, to the writer claim. This indirect connection can be represented as follows:

Supporting citation ----> Supported Citation ----> Writer Claim

The way in which Citations serve to support other Citations reflects the status of these studies as making different but entirely compatible contributions and this is an essential part of the consensus building process for the development of scientific knowledge. An example of Secondary support is given below:

EXAMPLE 9

1. *Folkow and Neil [20] for example, postulated that thickening of blood vessels in response to sustained high levels of blood pressure potentiates vascular reactivity.*
2. *The blood vessels of well-established hypertensives are certainly thicker than normal, and minor abnormalities may even be present in individuals with marginally elevated blood pressure levels [21].*

The second Citation (S2) provides secondary support of the first. In order for it to provide primary support it would have to show results that *thickening of blood vessels ..... potentiates vascular reactivity.* Sentence 2 does not do this. Instead it provides evidence that blood vessels do thicken. It thus backs up what is taken as given in Sentence 1, in

thickening of blood vessels in response to sustained high levels of blood pressure. By showing that there is a basis for one part of the first Citation, the possibility is that the reader will not be as inclined to dismiss the rest of it as being unfounded. The point is also that such supporting Citations are not crucial for the coherence of the argument the writer is developing.

The subsequent context for the Citations provided below reads:

If structural properties of the peripheral blood vessels were responsible for differences between groups cardiovascular reactivity should have been greater ... Instead responses were similar in both groups ...

This suggests that the first Citation is not a feasible explanation as it does not account for the results. Therefore, the support provided by Citation 2 is not part of the central argument. It could well have been omitted and no support provided for Sentence 1. But the writer is showing that he has explored all the possible explanations and evidence that might help to increase their acceptability is also provided. This indirectly serves to persuade his readers that the work is sound since informative hypotheses have been examined with fairness.

Complementary Support

Complementary support is provided by Citation of research which are parallel to the kinds of research referred to in the head Citation. The argument is drawn by analogy from other research in the field and, as with secondary support, the reported information does not provide direct support in the form of a Basis. The aim is to show that, in the parallel study, similar results were obtained or that similar conclusions were arrived at. In this way, the supporting study is shown to be of current relevance as it highlights the similarity of the results in a new context. The semantic relation between such Citations is often that of Matching Compatibility. An example of this is provided below.

EXAMPLE 10

1. *The winter snowstorm scene employed here is one in which vasospastic attacks are likely to occur and, indeed, produced the expected finger temperature decreases in Raynaud's patients.*
2. *Similar results were found by Lang [27] and Gelder and Mathews [28] who produced significant cardiovascular responses in phobic patients using imagined scenes of the phobic objects.*

Sentence 1 states results observed in Raynaud's patients while Sentence 2 provides the results of analogous studies of phobic patients. The point of

reporting the results and therefore the complementary support arises from the fact that results similar to the writer's own were obtained in the parallel study. This argues for the replicability of the study and the greater applicability of the findings in varied contexts. The semantic relation is that of Matching Compatibility and it is signalled both directly and indirectly. First there is the explicit signal *similar results*. There is also repetition and parallelisms between the two sets of results. (the preceding context shows that the *finger temperature decreases* in Sentence 1 is a cardiovascular response).

Citations providing complementary support are best identified by the signals of the Matching Compatibility relation as in the example above. Because the Citation has little function in the context apart from showing a similarity in the results of the cited study to other findings, the supporting Citation can be removed from its context without disturbing the text in any significant way.

Conclusion

This chapter has dealt with the motivation for reporting in the light of prevailing notions that it is in an inherent relationship with a statement of negative evaluation or refutation of the reported proposition. An examination of research articles to see how reporting functions suggests, however, that writers use Citations as an important device for persuasion. The scientific research article has increasingly been viewed as a persuasive genre and our study of the function of reporting suggests that there is a linguistic basis for regarding research articles as vehicles of persuasion.

More specifically, we proposed that Citations are introduced into the body of the reporting article because they support or are supported by some other statement in the context. A characterisation of Citations in terms of support was presented and this consisted of supporting citations, supported citations and non-supporting citations. A description of the ways in which the support role was evidenced in language elements included the role of explicit signals of support and of semantic relations. The head-support relation was proposed as an addition to the existing typology of semantic relations.

The support provided by Citations is seen as not all of the same sort and we also proposed the existence of a cline of support with degrees ranging from primary support to secondary support to complementary support. The ways in which these differ from each other is explored through relevant examples and the presence of particular identifying signals.

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